Listing of Claims:

1. (Previously presented) In a network having a sending computer system and a receiving computer system, each of the sending and receiving computer systems including a processor, a memory and a network adapter, the memory containing a data structure used for storing a common data buffer, a method for sending and receiving payload data by layers or sub-layers of at least one communications protocol, comprising the steps of:

(a) storing a first start pointer pointing to a first byte of the payload data in a first common data buffer of the sending computer system;

(b) adding a first header to the payload data in the first common data buffer at a location preceding the byte pointed to by the first start pointer according to a first protocol layer of the communications protocol at the sending computer system;

(c) adjusting the first start pointer to point to a first byte of the first header;

(d) invoking a send procedure of a second and lower protocol layer of the communications protocol at the sending computer system;

(e) transferring to the second protocol layer the start pointer by the send procedure, wherein the payload data is not copied in preparation for or during the send procedure;

(f) adding a second header to the payload data in the first common data buffer at a location preceding the first start pointer, wherein the second header is contiguous with the first header;

(g) sending the payload data and the first and second headers to the receiving computer system;

(h) storing the payload data and the first and second headers in a second common data buffer of the receiving computer system;

(i) invoking a receive procedure of a second protocol layer of the communications protocol at the receiving computer system;

(j) storing a second start pointer pointing to a first byte of the second header in the second common data buffer;

(k) adjusting the second start pointer to point to the first byte of the first header according to the second protocol layer at the receiving computer system;

(l) invoking a receive procedure of a first and higher protocol layer of the communications protocol at the receiving computer system; and

(m) transferring to the first protocol layer at the receiving computer system the second start pointer, wherein the payload data is not copied in preparation for or during the receive procedure.

2. (Previously presented) In a computer system including a processor, a memory and a network adapter, the memory containing a data structure used for storing a common data buffer, a method for sending payload data by layers or sub-layers of at least one communications protocol, the method comprising the steps of:

(a) storing a start pointer pointing to a first byte of the payload data in the common data buffer of the computer system;

(b) adding a first header to the payload data in the common data buffer at a location preceding the byte pointed to by the first start pointer according to a first protocol layer of the communications protocol;

(c) adjusting the start pointer to point to a first byte of the first header;

(d) invoking a send procedure of a second and lower protocol layer of the communications protocol at the sending computer system;

(e) transferring to the second protocol layer the start pointer by the send procedure, wherein the payload data is not copied in preparation for or during the send procedure; and

(f) adding a second header to the payload data in the first common data buffer at a location preceding the first start pointer, wherein the second header is contiguous with the first header.

3. (Previously presented) The method of claim 2 wherein a checksum is added to the header in the common data buffer preceding the payload data being sent.

4. (Previously presented) The method of claim 2 wherein the transferring step includes any application data or information required by the send procedure of the second and lower protocol layer.

5. (Previously presented) The method of claim 2 further comprising the step of (f) adjusting a size of the payload data to be sent by the second and lower protocol layer by adjusting the end pointer.

6. (Previously presented) In a computer system including a processor, a memory and a network adapter, the memory containing a data structure used for storing a common data buffer, a method for receiving payload data by layers or sub-layers of at least one communications protocol, the method comprising the steps of:

(a) storing the payload data, a first header, and a second header in the common data buffer of the receiving computer system, wherein the second header is contiguous with the first header;

(b) invoking a receive procedure of a second protocol layer of the communications protocol;

(c) storing a start pointer and an end pointer to the payload data;

(d) storing a second start pointer pointing to a first byte of the second header in the common data buffer;

(e) adjusting the start pointer to point to the first byte of the first header according to the second protocol layer;

(f) invoking a receive procedure of a first and higher protocol layer of the communications protocol; and

(g) transferring to the first protocol layer the start pointer, wherein the payload data is not copied in preparation for or during the receive procedure.

7. (Previously presented) The method of claim 6 wherein a checksum following the header and added by the sending computer system is removed from the received payload data in the common data buffer.

8. (Previously presented) The method of claim 7 wherein the checksum is removed by adjusting the start pointer of the common data buffer to point to a memory location following the checksum.

9. (Previously presented) The method of claim 6 further comprising the step of (m) transferring any application data or information required by the receive procedure of the first and higher protocol layer.

10. (Previously presented) A computer system for sending and receiving payload data by layers or sub-layers of at least one communications protocol, the computer system comprising:

a processor for processing data from an application program;

a sending component for sending the payload data,

wherein the sending component stores a first start pointer pointing to a first byte of the payload data in a first common data buffer of the sending computer system;

wherein the sending component adds a first header to the payload data in the first common data buffer at a location preceding the byte pointed to by the first start pointer according to a first protocol layer of the communications protocol at the sending computer system;

wherein the sending component adjusts the first start pointer to point to a first byte of the first header;

wherein the sending component invokes a send procedure of a second and lower protocol layer of the communications protocol at the sending computer system; and

wherein the sending component transfers to the second protocol layer the start pointer by the send procedure, wherein the payload data is not copied in preparation for or during the send procedure;

wherein the sending component adds a second header to the payload data in the first common data buffer at a location preceding the first start pointer, wherein the second header is contiguous with the first header; and

wherein the sending component sends the payload data and the first and second headers to the receiving computer system; and

a receiving component for receiving the payload data,

wherein the receiving component stores the payload data, the first header, and the second header in a second common data buffer of the receiving computer system;

wherein the receiving component invokes a receive procedure of a second protocol layer of the communications protocol at the receiving computer system;

wherein the receiving component adjusts the second start pointer to point to the first byte of the first header according to the second protocol layer at the receiving computer system;

wherein the receiving component invokes a receive procedure of a first and higher protocol layer of the communications protocol at the receiving computer system; and

wherein the receiving component transfers to the first protocol layer at the receiving computer system the second start pointer, wherein the payload data is not copied in preparation for or during the receive procedure.

11. (Previously presented) A computer system for sending payload data by layers or sub-layers of at least one communications protocol, the computer system comprising:

a processor for processing data from an application program;

a sending component for sending the payload data stored,

wherein the sending component stores a start pointer pointing to a first byte of the payload data in a common data buffer of the computer system;

wherein the sending component adds a first header to the payload data in the common data buffer at a location preceding the byte pointed to by the start pointer according to a first protocol layer of the communications protocol;

wherein the sending component adjusts the start pointer to point to a first byte of the first header;

wherein the sending component invokes a send procedure of a second and lower protocol layer of the communications protocol;

wherein the sending component transfers to the second protocol layer the start pointer by the send procedure, wherein the payload data is not copied in preparation for or during the send procedure;

wherein the sending component adds a second header to the payload data in the common data buffer at a location preceding the start pointer, wherein the second header is contiguous with the first header; and

wherein the sending component sends the payload data and the first and second headers to a receiving computer system.

12. (Previously presented) The computer system of claim 11 wherein the sending component adds a checksum to the header in the common data buffer preceding the payload data being sent.

13. (Previously presented) The computer system of claim 11 wherein the sending component transfers any application data or information required by the send procedure of the second and lower protocol layer.

14. (Previously presented) The computer system of claim 11 wherein the sending component adjusts a size of data to be sent by the second and lower protocol layer by adjusting the end pointer.

15. (Previously presented) A computer system for receiving payload data by layers or sub-layers of at least one communications protocol, the method comprising the steps of:

a processor for processing data from an application program;

a receiving component for receiving the payload data,

wherein the receiving component stores the payload data, a first header, and a second header in a common data buffer of the computer system, wherein the second header is contiguous with the first header;

wherein the receiving component invokes a receive procedure of a second protocol layer of the communications protocol;

wherein the sending component stores a start pointer and an end pointer to the payload data;

wherein the receiving component stores a second start pointer pointing to a first byte of the second header in the common data buffer;

wherein the receiving component adjusts the start pointer to point to the first byte of the first header according to the second protocol layer;

wherein the receiving component invokes a receive procedure of a first and higher protocol layer of the communications protocol; and

wherein the receiving component transfers to the first protocol layer the start pointer, wherein the payload data is not copied in preparation for or during the receive procedure.

16. (Previously presented) The computer system of claim 15 wherein the receiving component removes a checksum added by the sending computer system from the received payload data in the common data buffer.

17. (Previously presented)The computer system of claim 16 wherein the receiving component removes the checksum by adjusting the start pointer of the common data buffer to point to a memory location following the checksum.

18. (Previously presented) The computer system of claim 15 wherein the receiving component transfers any application data or information required by the receive procedure of the first and higher protocol layer.

19. (Previously presented) A computer readable medium containing a computer program for the sending and receiving payload data by layers or sub-layers of at least one communications protocol, the computer program comprising program instructions for:

storing a first start pointer pointing to a first byte of the payload data in a first common data buffer of the sending computer system;

adding a first header to the payload data in the first common data buffer at a location preceding the byte pointed to by the first start pointer according to a first protocol layer of the communications protocol at the sending computer system;

adjusting the first start pointer to point to a first byte of the first header;

invoking a send procedure of a second and lower protocol layer of the communications protocol at the sending computer system;

transferring to the second protocol layer the start pointer by the send procedure, wherein the payload data is not copied in preparation for or during the send procedure;

adding a second header to the payload data in the first common data buffer at a location preceding the first start pointer, wherein the second header is contiguous with the first header;

sending the payload data and the first and second headers to the receiving computer system;

adjusting the second start pointer to point to the first byte of the first header according to the second protocol layer at the receiving computer system;

invoking a receive procedure of a first and higher protocol layer of the communications protocol at the receiving computer system; and

transferring to the first protocol layer at the receiving computer system the second start pointer, wherein the payload data is not copied in preparation for or during the receive procedure.

20. (Previously presented) A computer readable medium containing a computer program for sending payload data by layers or sub-layers of at least one communications protocol, the computer program comprising program instructions for:

storing a first start pointer pointing to a first byte of the payload data in a first common data buffer of the sending computer system;

adding a first header to the payload data in the first common data buffer at a location preceding the byte pointed to by the first start pointer according to a first protocol layer of the communications protocol at the sending computer system;

adjusting the first start pointer to point to a first byte of the first header;

invoking a send procedure of a second and lower protocol layer of the communications protocol at the sending computer system;

transferring to the second protocol layer the start pointer by the send procedure, wherein the payload data is not copied in preparation for or during the send procedure;

adding a second header to the payload data in the first common data buffer at a location preceding the first start pointer, wherein the second header is contiguous with the first header; and

sending the payload data and the first and second headers to the receiving computer system.

21. (Previously presented) The computer readable medium of claim 20 wherein the computer instructions add a checksum to the header in the common data buffer preceding the payload data being sent.

22. (Previously presented) The computer readable medium of claim 20 wherein the computer instructions transfer any application data or information required by the send procedure of the second and lower protocol layer.

23. (Previously presented) The computer readable program medium of claim 20 wherein the computer instructions adjust a size of the payload data to be sent by the second and lower protocol layer by adjusting the end pointer.

24. (Previously presented) A computer readable medium containing a computer program for receiving payload data by layers or sub-layers of at least one communications protocol, the computer program comprising program instructions for:

storing the payload data, a first header, and a second header in the common data buffer of the receiving computer system, wherein the second header is contiguous with the first header;

invoking a receive procedure of a second protocol layer of the communications protocol;

storing a start pointer and an end pointer to the payload data;

storing a second start pointer pointing to a first byte of the second header in the common data buffer;

adjusting the start pointer to point to the first byte of the first header according to the second protocol layer;

invoking a receive procedure of a first and higher protocol layer of the communications protocol; and

transferring to the first protocol layer the start pointer, wherein the payload data is not copied in preparation for or during the receive procedure.

25. (Previously presented) The computer readable medium of claim 24 wherein the program instructions remove a checksum added by the sending computer system from the received payload data in the common data buffer.

26. (Previously presented) The computer readable medium of claim 25 wherein the program instructions remove the checksum by adjusting the start pointer of the common data buffer to point to a memory location following the checksum.

27. (Previously presented) The computer readable medium of claim 24 wherein the program instructions transfer any application data or information required by the receive procedure of the first and higher protocol layer.

28. (Canceled)

29. (Previously presented) A method for processing payload data in a computer system using layers of a network communications protocol, the method comprising the steps of:

(a) storing the payload data, a first header, and a second header in a data buffer, wherein the second header is contiguous with the first header;

(b) processing the payload data using a first protocol layer of the network communications protocol; and

(c) processing the payload data using a second protocol layer of the network communications protocol, wherein the payload data is not copied during and between being processed by the first and second protocol layers.

30. (Previously presented) The method of claim 29 wherein the payload data does not move within the data buffer during and between being processed by the first and second protocol layers.

31. (Previously presented) The method of claim 29 wherein the processing step(a) further comprises the steps of:

(a2) positioning a first pointer to point to a first byte of the payload data; and

(a3) positioning a second pointer to point to a last byte of the payload data, wherein the first protocol layer uses the first and second pointers to locate the payload data for processing.

32. (Previously presented) The method of claim 31 wherein the processing step (b) further comprises the steps of:

(b2) adding a first element to the payload data; and

(b3) moving the second pointer to point to a last byte of the first element, wherein the first pointer does not move when the first element is added.

33. (Previously presented) The method of claim 32 wherein the processing step (c) further comprises the steps of:

(c2) adding a second element to the payload data; and

(c3) moving the second pointer to point to a last byte of the second element, wherein the second protocol layer uses the first and second pointers to locate the payload data and the first element to add the second element, wherein the first pointer does not move when the second element is added.

34. (Previously presented) The method of claim 33 wherein the first element comprises a header associated with the first protocol layer.

35. (Previously presented) The method of claim 33 wherein the first element comprises a checksum associated with the first protocol layer.

36. (Previously presented) The method of claim 33 wherein the second element comprises a header associated with the second protocol layer.

37. (Previously presented) The method of claim 33 wherein the second element comprises a checksum associated with the second protocol layer.

38. (Previously presented) A system for processing payload data using layers of a network communications protocol, the system comprising:

a processor for processing data from an application program; and

a component that stores the payload data, a first header, and a second header in a data buffer, wherein the second header is contiguous with the first header, wherein the component further processes the payload data using a first protocol layer of the network communications protocol and a second protocol layer of the network communications protocol, and wherein the payload data is not copied during and between being processed by the first and second protocol layers.

39. (Previously presented) A computer readable medium containing a computer program for processing payload data using layers of a network communications protocol, the computer program comprising program instructions for:

storing the payload data, a first header, and a second header in a data buffer, wherein the second header is contiguous with the first header;

processing the payload data using a first protocol layer of the network communications protocol; and

processing the payload data using a second protocol layer of the network communications protocol, wherein the payload data is not copied during and between being processed by the first and second protocol layers.

40. (Previously presented) The computer readable medium of claim 39 wherein the payload data does not move within the data buffer during and between being processed by the first and second protocol layers.

41. (Previously presented) The computer readable medium of claim 39 wherein the program instructions for storing the payload data in a data buffer further comprise program instructions for:

positioning a first pointer to point to a first byte of the payload data; and

positioning a second pointer to point to a last byte of the payload data, wherein the first protocol layer uses the first and second pointers to locate the payload data for processing.

42. (Previously presented) The computer readable medium of claim 41 wherein the program instructions for processing the payload data using a first protocol layer further comprise program instructions for:

adding a first element to the payload data; and

moving the second pointer to point to a last byte of the first element, wherein the first pointer does not move when the first element is added.

43. (Previously presented) The computer readable medium of claim 42 wherein the program instructions for processing the payload data using a second protocol layer further comprise program instructions for:

adding a second element to the payload data; and

moving the second pointer to point to a last byte of the second element, wherein the second protocol layer uses the first and second pointers to locate the payload data and the first element to add the second element, wherein the first pointer does not move when the second element is added.

44. (Previously presented) The computer readable medium of claim 43 wherein the first element comprises a header associated with the first protocol layer.

45. (Previously presented) The computer readable medium of claim 43 wherein the first element comprises a checksum associated with the first protocol layer.

46. (Previously presented) The computer readable medium of claim 43 wherein the second element comprises a header associated with the second protocol layer.

47. (Previously presented) The computer readable medium of claim 43 wherein the second element comprises a checksum associated with the second protocol layer.